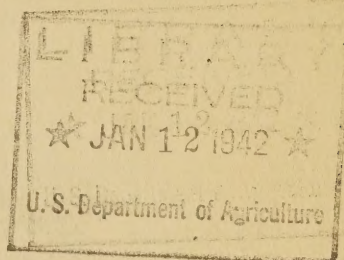


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UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics

in cooperation with

UNIVERSITY OF NEVADA
Agricultural Experiment Station



AN ECONOMIC STUDY OF THE VIRGIN VALLEY

in

Southeastern Nevada

Cruz Venstrom
State BAE Representative

ACKNOWLEDGMENTS

This report is a part of a contemplated comprehensive physical and social study by the Resettlement Administration of the Virgin Valley communities in southeastern Nevada. Organization changes within the U. S. Department of Agriculture, which later carried the particular division into the Bureau of Agricultural Economics, limited the scope of the study.

Clyde Stewart of the Resettlement Administration assisted on the farm business survey and on the record tabulations; John E. Guernsey and John P. Sparks made the soil survey; and Milo B. Williams did the surveying for the base maps and provided data on the canal system and on drainage problems.

The Nevada Extension Service staff was consulted freely. The regional staffs of the Land Economics Division of the Farm Security Administration, and later of the Bureau of Agricultural Economics, assisted materially in appraising the data and in shaping up the report.

AN ECONOMIC STUDY OF THE VIRGIN VALLEY

by

Cruz Venstrom*

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SUMMARY

The population of the Virgin Valley in southeastern Nevada is more than the resources of the valley can support at a satisfactory level of living. Of 167 physically active family heads in the valley in 1937, 38 had no property resources and no regular work and 54 additional had inadequate means of support.

Most of the farms in the valley are too small. The 90 farms averaged 30 crop acres per farm, but only 18 had more than 30 crop acres. For 39 farms on which farm business analysis records were obtained for the year 1936, the average labor income of the farm family was only \$391. Very little additional land is suitable for cultivation. Some improvement in farm incomes can be obtained through more stable irrigation diversions that will provide a dependable supply of irrigation water, and by better farming practices. In most cases, however, increasing present low farm incomes enough to support a family even at a very modest level of living can be accomplished only by combining the present small units into farms of at least 30 or 40 acres of crops.

There are serious problems of irrigation water diversions, floods, and siltation which should have immediate attention. Technical investigations have been made to determine the extent of these problems and the general nature of the measures necessary for their solution. However, the flood hazards are a part of the wider flood problems of the entire Virgin River system, which is authorized for a flood survey by the United State Department of Agriculture and War Department.

The principal resource of the valley, other than agriculture is the opportunity to supply highway travel services. in 1937 these highway businesses were over-developed, and excessive competition had eliminated most of the profits. There appeared little possibility of easing the population pressure on the land by expansion of the travel services or other kinds of business enterprises or occupations,

The valley is having extreme difficulty in supporting its necessary public services. In the school district in which most of the valley is located, only about 12 percent of the school cost is supported by local property; the assessed valuation of the farm and other local business property is only about \$700 per student in average daily attendance as compared with over \$5,000 per student for the state as a whole. Direct and indirect relief payments in the valley by federal, state, county and private agencies have been heavy.

It is estimated that the total farm and business resources of the valley would provide a reasonably adequate living for about 130 to 140 families. In 1937 there were 50 to 60 families and 25 to 30 single men 21 to 30 years of age in the valley for whom there was no prospect of adequate support. To meet this problem the people of the valley and representatives of interested public agencies should give consideration

to means of preventing further subdivision of farms; to encouraging and facilitating the combining of small farms into adequate sized units; to providing vocational guidance in the public school that will assist young people in finding occupations elsewhere; and to arrange for such additional investigations as may be required of irrigation diversion, flood, and siltation problems.

INTRODUCTION

The Virgin Valley Communities have a low average income. In recent years the communities have been pressing more heavily on their resources. Business conditions for a number of years have not favored the migration of the excess population. Since the establishment of the many forms of federal relief and rehabilitation, the calls from the Virgin Valley for aid have been frequent.

The purpose of this study was to obtain information that would contribute to an understanding of the problems of the Virgin Valley, particularly those related to utilization of the land and water resources, and that would assist in making plans to meet the problems. The study was made in close cooperation with leaders in the Valley communities and data obtained in it were discussed with local people in community meetings and with the county planning committee.

General Description

The Virgin Valley is located on the Virgin River in the eastern part of Clark County, Nevada, and in northwestern Mohave County, Arizona.

The Virgin River arises in southwestern Utah near Zion Park. It flows in a general southwesterly direction until it empties into Lake Mead, the reservoir formed in the Colorado River by Boulder Dam. About 50 miles above its mouth the Virgin River has cut a deep canyon, known locally as the "Narrows", through the Virgin Mountains. The irrigated area above the Narrows is known as the "Dixie" Section of southern Utah.

The Virgin Valley, geographically, is that section of the Virgin River basin between the Narrows and the end of the river in Lake Mead. In the common usage the term Virgin Valley applies only to the narrow river bottom area in which the irrigated lands are located.

The population of the Virgin Valley is principally in the two communities of Bunkerville and Mesquite, Nevada, which lie on opposite sides of the Virgin River within three miles of the Nevada-Arizona

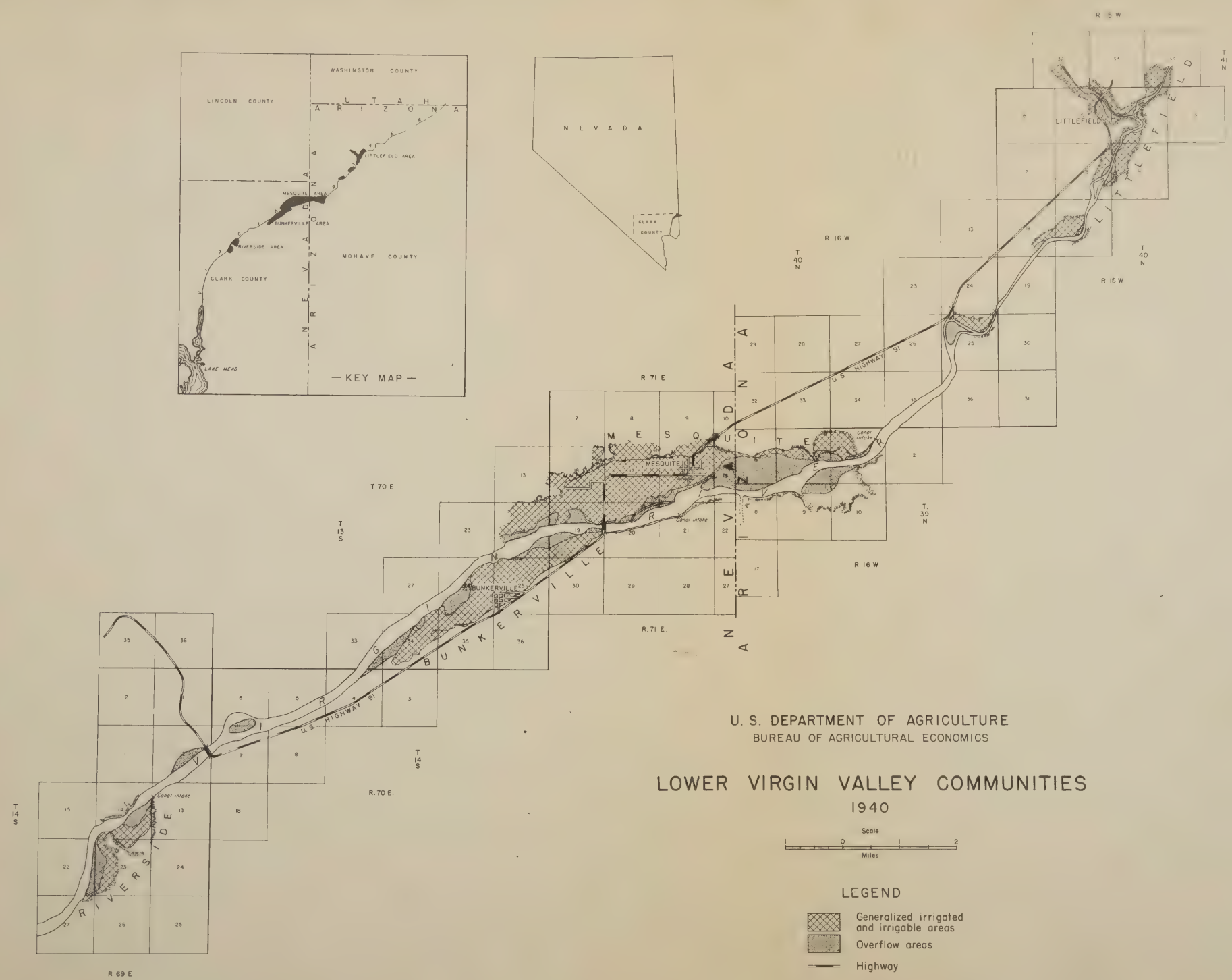
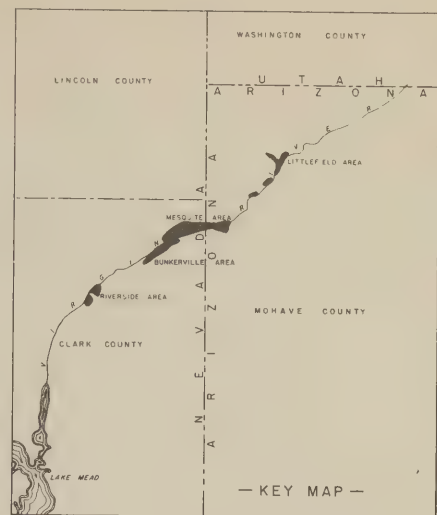
state line (Figure 1). Littlefield, Arizona is located twelve miles above the major communities at the junction of Beaver Dam Wash and the Virgin River. It was included in the study because it is isolated from Kingman, the trading center of Mohave County, by the impassable Colorado River Canyon, and it is socially and economically a part of the Virgin Valley. Riverside is the name applied to the small cultivated area below the Riverside highway bridge, about five or six miles downstream from Bunkerville, and considered a part of that community. In 1937 Mesquite contained 99 families, Bunkerville 71 families, and Littlefield 20 families, or a total of 190 families in the three communities.

The Arrowhead Trail, U. S. Highway No. 91 from Los Angeles to Salt Lake City, goes through all three villages. The nearest railroad shipping point is Moapa, Nevada, about 35 to 50 miles distant. Las Vegas, the nearest trading center in Nevada is 85 miles west. St George, Utah is about 50 miles northeast of the Valley.

The population is almost entirely Mormon in faith and each of the three communities maintains church organizations. Bunkerville was settled in 1877 by a "call" of the Latter Day Saints Church, and its history has been continuous since that date. Littlefield was originally a part of the Bunkerville ward of the Latter Day Saints Church, but now has a separate ward organization. The "Mesquite Flat", as Mesquite was originally called, was colonized two years later in 1879. The canal to the Mesquite area was more costly to construct than that on the Bunkerville side. In the early years of settlement, the floods caused so much damage to the Mesquite irrigation works that the farmers were repeatedly discouraged, and the settlement was abandoned in 1891. Mesquite was again settled in 1895 and has developed steadily since that time. An excellent history of the Bunkerville and Mesquite communities, written in 1934 by Francis H. Leavitt, ^{1/} describes in considerable detail the early experiences of the two communities and the constantly recurring difficulties they have had with the irrigation system.

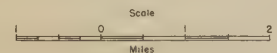
About 11,000 acres are owned by the residents and farm operators. Within this 11,000 acres are located 2,744 acres of irrigated lands and some parcels acquired to control stock water. The irrigation water is obtained largely from the Virgin River. Ample water is available during the spring run-off period, but it is limited in summer. An area of about 700,000 acres of grazing land surrounding the Valley is used by the Virgin Valley communities. About one-half of this is in Nevada Grazing District No. 5 and the other half in Arizona Grazing District No. 1.

^{1/} "Influence of the Mormons in the Settlement of Clark County" by Francis H. Leavitt, M. S. Thesis, 1934, University of Nevada.



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LOWER VIRGIN VALLEY COMMUNITIES
1940



LEGEND

- Generalized irrigated and irrigable areas
- Overflow areas
- Highway
- Canals
- Bluffs

Elevation and Climate

Most of the irrigated land is at Bunkerville and Mesquite at an elevation near 1,700 feet. The lowest ranches in Riverside are at an elevation of about 1,400 feet and in Littlefield, about 1,900 feet. Grazing lands in this district range from about 1,300 feet elevation near the shore of Lake Mead to about 6,000 feet on the plateaus in Arizona east of the Virgin Mountains.

About 250,000 acres, or one-third of the area, has an elevation of over 4,000 feet. Most of the grazing forage is produced on this higher area which has an estimated precipitation from about eight inches at 4,000 feet to twenty or more inches on the high points of the Virgin Mountains. Because of the low average rainfall and the porous limestone formation of the Virgin Mountains, surface stream flows are very limited and springs are infrequent.

The nearest weather station is at Logandale in the Moapa Valley, about twenty-five miles west of the town of Bunkerville. The climatic records from this station closely approximate the weather of the Virgin Valley, although the total precipitation is probably slightly higher in the Valley because it is closer to the Virgin Mountains than Logandale. These records indicate a frost-free period of 235 days, a mean monthly maximum temperature of 105 degrees in July, and a mean monthly minimum of 31 degrees in December and January. Summer temperatures of 110 degrees are common.

The average annual precipitation is between 5.5 and 6.0 inches. January, with an average of .92 inches, has the highest monthly precipitation; May and June average only .16 and .13 inches respectively. Snows are infrequent in winter.

The sudden local shower type of precipitation is characteristic of the summer season over the entire watershed. The heavy "cloudburst" form is most frequent in July, August and September and frequently causes flood runoff into the Virgin River. Proximity to the Virgin Mountains may slightly increase the cloudburst frequency in the Virgin Valley over the frequency indicated by the Logandale records.

Most of the water in the Virgin River comes from winter snows in the mountains north of Zion Park in southern Utah. The critical summer flow, however, which is most important to the Virgin Valley farmers, comes largely from thermal springs between Littlefield and the Narrows. The irregular higher flows, both from melting snows and summer rains greatly affect the agriculture in that the diversion structures are damaged, causing irregular flow of water in the canals.

SOILS

A soil survey made as part of the study of the Virgin Valley, provided information on the kinds and extent of the soil, types, water table conditions and alkali accumulations. 2/

The soils in use range from very loose sandyloams to heavy clays. Although hardpan formations are characteristic of the adjacent older Mesa soils, they are negligible in the soils irrigated. The greater portion of the area farmed at Mesquite consists of the sandy soils on the alluvial fans of the side washes. The silt laden irrigation water improves these coarser-textured soils which are well drained and characterized by little or no alkali accumulation.

The soils at Bunkerville and Riverside are of finer texture and have been formed largely by river action. The high water table does not permit the full realization of their inherent productive qualities. Alkali accumulations are present in a number of places.

About 400 acres of unimproved land in scattered parcels under the present canal system have potential economic value. In general, however, these unimproved areas have some undesirable features such as irregular relief, heavy brush, or poor drainage, which would make development expensive or slow. Farmers have been and now are adding to their crop acreages by working on some of these difficult remnants by washing sand dunes by means of idle irrigation streams and by some horse and scraper work. In their present state these lands have little, if any, economic value.

The unimproved lands situated above the canals in addition to having irregular relief will require additional water costs which, in most cases, would prevent successful development.

All of the native soils are low in organic matter and available phosphorous. Phosphate fertilization has been a common practice for more than ten years.

Lack of highly productive soils and dependable water supplies have been factors limiting production of vegetable crops.

2/ The soil survey, covering about 8,000 gross acres in the valley bottom and adjacent slopes to the mesa bluffs, was made in 1937 by the Resettlement Administration. The discussion of the soils is based on this survey data which was turned over to the Soil Conservation Service in 1939 for use in connection with its conservation survey of the Virgin Valley Soil Conservation District.

IRRIGATION, FLOODS AND SEDIMENTATION

The source of all the irrigation water, with the exception of a small supply from the Beaver Dam Wash and from thermal springs located above the river bed near Littlefield, is the Virgin River. In summer all the flow in the upper river is diverted for irrigation in the Dixie section of southern Utah and no flow reaches the Narrows above Littlefield. The summer water used in the lower Virgin Valley communities is derived largely from thermal springs located in the Narrows and along the stream from the Narrows to Littlefield, and from water which rises in the stream bed from Littlefield to Riverside.

In 1936, the total irrigated area in the Valley was approximately 2,744 acres. The 233 acres irrigated in the Littlefield area with water from Beaver Dam Wash (Creek) and springs had no serious diversion problem. The remaining 2511 acres were served by six insecure diversions directly from the Virgin River. These diversions and the approximate acreages irrigated from them were:

Littlefield (3 diversions)	150 acres
Mesquite Irrigation Co.	1427 acres
Bunkerville Irrigation Co.	820 acres
Riverside	114 acres

Total irrigated from Virgin River. . . . 2511 acres

The major diversions are for the Mesquite and Bunkerville communities and each canal heads at a brush and rock dam across the river channel. The Riverside diversion uses a low dam. The three diversions near Littlefield were gravity flows from the channel or crude water wheel lifts.

Flood flows in the Virgin River, both from melting snows in the spring and from summer storms, frequently wash out or damage the semi-permanent brush and rock dams. Floods originating on the mesa south of Bunkerville have seriously damaged the Bunkerville canal.

Flood damage may range all the way from slight impairment to complete destruction of the canal head works and may result in interruptions in the delivery of irrigation water from a very few days to several weeks. This interruption of irrigation water delivery is a serious hazard to farming in the valley. Few seasons have passed without an interruption of irrigation flows. At least one damaging flood can be expected every spring and as many as three serious floods have been experienced. The summer floods are particularly damaging because they interrupt delivery of irrigation water when the demand is heaviest and the regular stream flow the lowest. Not only is the delivery of irrigation water interrupted by these floods, but the repairs to the diversion dams frequently require the entire labor supply of the communities for considerable periods of time.

The Virgin River floods also cause bank cutting, and a considerable acreage of crop land, especially in the Bunkerville area, has been destroyed in this manner.

During most of the year the water in the Virgin River carries a heavy load of sand and silt. Although each canal for the two major areas has a number of sand traps to remove this silt load, much of the finer material reaches the fields. The silts are a desirable binder in the sandy Mesquite fields, which have much slope, and also improve the water holding capacity of these soils. On the rather level lands and heavier soils in the Bunkerville fields the continued deposition of silts at the head of the runs is distorting the field topography and causing surface pockets and drainage difficulties.

The area irrigated at Mesquite has been increasing slowly but steadily, due to the constant leveling of land by the use of flowing water in the rougher sand areas and by some leveling by horses and scrapers. In Bunkerville the area in use has decreased because of the meandering and side-cutting of the river into the irrigated lands. New lands are not available to balance this loss. The acreage irrigated annually in the detached areas at Riverside and Littlefield varies considerably because of the diversion difficulties. Diversion from the river is too big a task for these groups of one to four farmers.

In the Nevada adjudication of water rights in the Mesquite and Bunkerville areas the duty of water for the seven summer months was set at 4.25 acre feet. Using this duty of water, the 2511 acres irrigated from the Virgin River require 10,672 acre feet of water for the season, or 1525 acre feet per month. During the period of record (1930-1936) the lowest monthly discharge recorded at the Littlefield gauging station (May 1934) was 2990 acre feet. (Appendix Table 1)

While the total seasonal allowance of 4.25 acre feet of water appears ample as a net duty of water delivered to the farms, the monthly requirements are not uniform. Unfortunately, the heaviest demand for water occurs in mid-summer and coincides with the period of lowest stream flow. Also, all of the total stream discharge is not divertible. Interruptions in delivery of water from storms are frequent in mid-summer and result in peak demands which are difficult to meet from the divertible stream flow. It appears that, if diversion facilities adequate to maintain constant flows in the canals can be provided, the flow of the Virgin River is sufficient for the irrigation requirements of the Valley.

The Bunkerville and Mesquite areas are served by two mutual irrigation companies. Records of the amount of annual assessments were available for the Bunkerville Irrigation Company since 1924, and for the Mesquite Irrigation Company since 1929 (Table 1).

In these periods the Bunkerville assessments per share of stock have varied from \$3.40 to \$9.65 annually and the Mesquite assessments from \$1.30 to \$4.95. The Bunkerville Irrigation Company had 811 shares

of stock and 820 acres irrigated. The Mesquite Irrigation Company had 1314 shares of stock and 1427 acres irrigated. Therefore, the assessments per share approximately represent assessments per acre irrigated.

Only small amounts of the assessments are paid in cash. Most of the expenses of both companies are incurred in the man and team labor cost of replacing the river diversion dams.

Table 1.- Annual Assessments of the Bunkerville and Mesquite Irrigation Companies, Virgin Valley, per Share of Stock

Year	Bunkerville	Mesquite
1924	\$3.55	no record
1925	3.45	" "
1926	3.40	" "
1927	5.05	" "
1928	4.65	" "
1929	2.75(Incomplete)	
1930	5.25	\$2.50
1931	3.95	4.35
1932	9.65	4.95
1933	6.50	1.30
1934	3.40	1.70
1935	4.30	2.10
1936	5.88	2.00

AGRICULTURE

Type of Farming

In 1936 there were 90 farms in the Valley with more than 5 crop acres. As determined from AAA records these farms had an average of 30 crop acres per farm and were distributed by crop acreage groups as follows:

<u>Crop Acres</u>	<u>Number of Farms</u>
5.1 - 10.0	9
10.1 - 20.0	42
20.1 - 30.0	21
30.1 - 40.0	9
Over 40	9
Total	90

The principal type of farming in the Valley is small general farms supplying products to the limited local markets and to Las Vegas. A few of the larger units have a major source of income from range cattle. Seventeen of the farm operators had permits for about 1100 head of cattle in the Nevada and Arizona grazing districts. Of these, 11 had permits for 20 to 50 head, 4 for 50 to 100 head, and 2 for more than 100 head.

In 1936, 41 percent of the irrigated land was in alfalfa, 36 percent in grain, 9 percent in miscellaneous crops, largely sugar beet seed, truck crops, and sorghum, and 14 percent was idle or fallow.

Farm business analysis survey records were obtained from 39 farms, covering the year 1936. These farms were representative of the Valley farms, although they averaged slightly smaller with 26.5 crop acres per farm as compared with 30 crop acres for all farms.

The 39 farm survey records were grouped as to size of business by the calculated number of productive work units $\frac{3}{4}$ (P.W.U.) per farm. The average use of land by the farms in these size groups is shown in Table 2. The average crop acreage varied from 17.2 acres per farm in the smallest size group to 38.3 acres in the largest.

Table 2.- Average Use of Land per Farm, 1936, by Size Groups

			Productive work units			
			100 to	150 to	250 & over	
	Unit		149	249		All Groups
Records	No.		12	19	8	39
Land use						
Crop land						
Alfalfa	Acres		8.3	10.8	15.1	10.9
Grain	"		6.0	9.2	14.6	9.4
Miscellaneous crops	"		1.0	2.5	3.1	2.1
Orchard and vineyard	"		.2	.5	.1	.3
Idle and fallow	"		1.7	4.4	5.4	3.8
Total crop land	"		17.2	27.4	38.3	26.5
Farmstead	"		1.1	1.2	1.4	1.2
Pasture and waste	"		20.3	28.5	120.7	45.1
Total land	"		39.1	57.1	160.4	72.8

$\frac{3}{4}$ A productive work unit (P.W.U.) is an average days work by an average farmer. The basis of calculation of the P.W.U. per farm in this study is given in Appendix Table 2.

The average number of head of livestock per farm, by size groups, is shown in Table 3.

Table 3.- Average Livestock Numbers per Farm at the End of 1936 by Size Groups

	:	:	Productive work units			:	All
			100 to	150 to	250 &		
	Unit		149	249	over		Groups
Records	No.		12	19	8	:	39
Dairy cows	"		2.1	3.1	4.1	:	3.0
Other dairy cattle	"		1.6	3.3	4.4	:	3.0
Beef cows	"		.7	2.3	33.5	:	9.4
Beef cattle, other	"		.5	2.2		:	
Hogs, sows	"		.3	.6	.9	:	.6
Hogs, other	"		2.5	3.5	5.2	:	3.6
Work horses	"		1.7	2.2	2.5	:	2.1
Other horses	"		.4	.6	1.9	:	.8
Laying hens	"		69.	94.	149.	:	98.

Average labor requirements and labor supply are shown in Table 4. The units in the group requiring over 250 P.W.U.'s after allowing for some outside work were large enough to occupy the full time of the operator. Probably not over 25 of the farms in the Valley are in this size group. All the remaining farms are too small to fully use the time of the operator. Even after considering outside work the available labor supply of the farm operators and their families for the Valley was utilized to only two-third's capacity. (Table 4)

The average yield of alfalfa was 3.66 tons per acre. Water diversion difficulties in 1936 reduced the yield to some extent. The alfalfa stands last only from four to five years. Bermuda grass infests the fields very rapidly and necessitates a fallow period to kill it out. Phosphate fertilizers are used on alfalfa by a number of the farmers. Wheat averaged 1,400 pounds per acre and barley 1,531 pounds.

Practically no land is planted primarily for pasture use. The acreage listed as pasture is mostly river bottom land from which a limited amount of natural grass and browse feed is obtained. Grain and alfalfa fields are generally pastured all winter, and poor stands of alfalfa may be pastured all year. This excessive pasturing contributes to the short life of the alfalfa stands and speeds up the Bermuda grass infestations.

Table 4.- Average Labor Required in Productive Work Units and Labor Available in Days, per Farm, 1936, by Size Groups

		Productive work units :			
		100 to	150 to	250 & over	All Groups
	Unit	149	249		
Records	No.	12	19	8	39
Labor required for					
Crops	P.W.U.	53	90	137	88
Livestock	"	70	112	135	114
Total on farm	"	123	202	322	202
Work off farm	Days	92	86	72	85
Total required labor	"	215	288	394	287
Labor available					
Hired	"	13	8	29	14
Family	"	75	140	118	116
Operator	"	262	289	300	283
Total labor available	"	350	437	447	413
Percent available labor used	per-	61	66	88	69
	cent				

The uncertainty of summer water, soils of only medium fertility, lack of market advantage, and limited maximum acreage, have been factors explaining the negligible acreage of cash crops.

Farm Capital and Indebtedness

Farm assets, liabilities and net worth are shown for the different size groups in Table 5. The total farm assets ranged from an average per farm of \$1,790 in the small size group to \$5,939 in the group of largest farms. The total assets varied from an average of \$2,649 per farm in the small size group to \$6,969 in the largest size group. The average indebtedness of only \$300 to \$400 per farm in the two lower size groups reflects the small size and subsistence nature of most farms in the size range requiring less than 250 P.W.U.'s of labor. These small units have very limited loan values.

The net worth progressed regularly from an average of \$2,286 per farm in the size group of 100 to 149 P.W.U.'s to \$6,149 per farm in the size group of 250 P.W.U.'s and over.

Table 5.- Average Inventory and Net Worth per Farm, 1936, by Size Groups

		Productive work units			
		100 to	150 to	250 &	All
	Unit	149	249	over	Groups
Records	No.	12	19	8	39
Farm assets					
Land	Dol.	1154	1929	3289	1970
Farm buildings	"	53	116	134	100
Machinery and equipment	"	208	369	639	375
Livestock	"	209	427	1466	573
Horses	"	99	149	254	155
Feed and supplies	"	67	101	207	112
Total farm assets	"	1790	3091	5989	3285
Personal assets					
Dwelling	"	323	638	876	744
Cash	"	3	2	---	2
Personal share of car	"	33	28	104	45
Total personal assets	"	859	668	980	791
Total Assets	"	2649	3759	6969	4076
Less Total Liabilities	"	363	277	820	415
Net Worth	"	2286	3482	6149	3661

The small tracts have a high value for homes and for produce for family use, but only the larger units have appreciable earning power on an investment basis. This is the major reason why the average mortgage indebtedness of the small units is low.

The indebtedness by source was: bank loans, 21.3 percent; rural rehabilitation loans, 18.0 percent; mercantile credit, 16.9 percent; private mortgages, 13.8 percent; medical bills, 12.9 percent; miscellaneous, mostly car, truck, and machinery contracts, 13.0 percent; relatives, 2.9 percent; and delinquent taxes, .7 percent. The rehabilitation loans and medical bills were concentrated in the smaller farm size, and the mortgages on the larger size farms.

There was no significant tax delinquency.

Farm Income and Expenses

About two-thirds of the gross income came from farm production ^{14/} and one-third came from other sources, mostly labor off the farm. Major sources of income from farm production were eggs, 12.8 percent; baled hay, 10.3 percent; cattle, 9.5 percent; grain 7.9 percent; hogs, 6.4 percent; poultry, 5.7 percent; and butterfat, 4.3 percent.

Gross receipts from farm production and outside work varied from an average of \$719 per farm in the smallest size group, to an average of \$1730 per farm in the largest size group.

The income from cattle sales was concentrated in the large size group which had the greater part of the land available outside grazing resources. Cattle sales probably accounted for a larger proportion of the farm income of the valley than indicated above. The other sources of income were well distributed in all farm size groups. It is significant, however, that the largest size group had the highest average value of sales per farm of eggs, grain, miscellaneous crops, hay and hogs. Income from outside work is relatively more important on the smaller farms. About three-fourths of the income available per family living in the two middle groups and one-third of the income available for family living in the large size group came from outside work. (Appendix Table 3.)

The largest single item of expense on most farms was the water assessment. In most cases, however, this was worked out by the operator or members of his family. Feed, largely for poultry, was a common item of importance. Detail of expense by groups is given in Appendix Table 4.

Property taxes ranged from an average of \$38 per farm in the smallest size group to \$54 per farm in the largest size group. Taxes average four percent of the gross income of all farms. This compares with an average of 3.5 to 5.1 percent for generally similar farms in other parts of Nevada in the same year.

The farm income and expenses are summarized by size groups in Table 6. The "return to operator's equity and to the operator and family labor" is derived by subtracting from the gross receipts the current operating expenses, depreciation allowances, and interest on indebtedness. This equity and labor return averaged (from small to large size) \$290, \$514, and \$957 respectively, per farm. This compared with cash living costs of \$459, \$632, and \$567, respectively. Details of family living expenses are given in Appendix Table 5.

^{14/} "Farm production" means all income from agricultural sources; therefore, it includes production from both grazing lands and irrigated lands.

Table 6.- Summary of average farm business earnings, 1936, by size groups.

		Productive work units			All Groups
		Unit	100 to 149	150 to 249	250 & over
Record	No.	12	19	8	39
1. Total farm receipts	Dol.	719	1076	1730	1110
Expenditures					
2. Current operating	"	371	480	686	439
3. Depreciation of buildings and equipment	"	41	72	89	66
4. Total	"	412	552	775	555
5. Return to capital, operator and family labor	"	307	524	1005	555
6. Less interest on indebtedness	"	17	10	48	20
7. Return to operator's equity and operator and family labor	"	290	514	957	535
8. Family labor income <u>1/</u>	"	217	369	706	391
9. Cash living expenses per family	"	459	632	567	565

1/ Item 5 minus 5% interest on total farm assets (Table 5).

When cash operating expenses were deducted from the receipts from sales of farm products, it was found that the farms in the small size group produced just about enough cash income to meet the cash operating expenses and the only contribution to the family was the value of the housing and the products used directly in the home.

Only the largest size group of farms had net incomes appreciably in excess of cash family living expenses, in spite of the very low payments of interest on indebtedness. Only the farmers in this group, according to these figures, would have any possibility of paying for their farms out of farm income.

From these figures and the judgment of leading farmers in the Valley, it is estimated that with the type of farming now practiced a farm unit of at least 30 or 40 crop acres is necessary in most cases to provide an adequate family living according to prevailing standards in the Valley.

Farm Tenancy

Information on the number of tenants and acres of leased land was obtained from the Nevada AAA records for 1936, (Table 7). Few complete farm units are available for lease, so there are few full tenant operators. Because most resident operators do not have enough land or livestock to use all available family labor, the parcels available for lease are in demand to supplement the owned land. Forage crops harvested from the leased lands are usually fed on the owned lands. This aspect of leasing favors the owned lands at the expense of the fertility of the leased lands.

Table 7.- Number of tenants and owner-tenants; crop acres operated under lease; and the proportion of crop acres leased to the total, 1936. Nevada only.
Source: AAA Records

		Mosquito	Bunkerville	Total
Total number of farms (with over five crop acres)	:	41	36	77
Number of full tenants	:	4	5	9
Number owners leasing additional land:	:	2	5	7
Total Crop acres	:	1049	325	1374
Total crop acres leased	:	132	198	330
Percent crop acres leased	:	13	24	18
Crop acres operated by full tenants	:	96	82	178
Percent of total crop acres operated by full tenants	:	9	10	9

Much of the land leased is either from or by close relatives. The percent of full tenant operators seems little more than the amount found in the relatively stable and high income areas of western Nevada.

All of the full tenant operators were on general farm types, and none on the range livestock units. The tenure period is usually for more than one year.

Twelve of the farm business records contained information on land leases. The common leasing arrangements in 1936 were: (1) one-third of harvested crops to the landlord with tenant paying or working out water assessments, and, (2) cash rent about \$5 per crop acre with tenants paying water assessments.

POPULATION TRENDS AND MIGRATION

The population of the Virgin Valley in 1936 was approximately 900 persons, all classed as rural. From an analysis of Latter Day Saints Church records population trends by communities were estimated as shown in Table 3.

Table 3.- Population Trends as Estimated from Church Records

Year	Bunkerville	Mesquite	Littlefield	Total
	No.	No.	No.	No.
1915	275	300	100	675
1920	275	400	100	775
1930	290	475	100	865
1936	300	435	115	900

In 1936, about 740 of the 900 residents lived in Nevada, and about 160 in Arizona. The large increase in the Mesquite population reflects the continuous development of land, and highway travel service since 1915. The very small growth of Bunkerville is an indication of the early development of population pressure on the limited soil resources on the south side of the river. The increase in population indicated at Littlefield is due to the construction, by outside capital, of a large tourist lodge and auto court where the Arrowhead Trail Highway crosses Beaver Dam Wash.

Ward records of Mesquite showed 372 births, and 52 deaths from 1915 to 1936. The net difference is 320 people, but the population of Mesquite increased only 185 in the same period. This indicates a net emigration of 320 less 185, or 135 people in 22 years.

Population trend data show that the net emigration was very light up to 1925, and that it has been increasing since 1925.

The upward trend of population at Mesquite has not been due solely to the relationship of births, deaths and migration of the excess. People are coming and going continually, as evidenced by the Bunkerville ward data which showed 331 members received from other wards and 443 removals to other wards since 1915. The removals include the excess population born in the community as well as the people transferred in and unable to gain an economic foothold. Although comparable data were not available for both Mesquite and Bunkerville, the birth rates, death rates, and migration were generally similar in both communities. The comparatively stationary population of Bunkerville showed that the excess population did leave the community.

The vocational agriculture department of the high school had a current record of the location and occupation of each student who had enrolled in one or more agricultural courses. Since most of the male graduates have taken agricultural work, this record gave a good check on the

extent of diffusion of the male high school graduates outside of the Virgin Valley.

These records were tabulated in December, 1936, covering the period 1920-35. The 1936 records were not used as the graduates had only a few months' time to make adjustments. The extent of the diffusion of the 94 living male graduates in the 16-year period is indicated by the following table of 1936 locations:

Still in the Virgin Valley.....	54
In nearby Nevada (Moapa, Las Vegas, Pioche).....	15
In nearby Utah (Washington Co.)..	2
Other Nevada.....	4
Other Utah.....	7
Other states (mostly California)..	11
Mission.....	<u>1</u>
Total.....	94

The occupational distribution of the 94 living male graduates is shown by these same records:

Laborers.....	33
Farming (owners or renters).....	21
Farming (partners).....	11
Teacher (agricultural).....	3
Teacher (other).....	6
Still in school.....	5
Carpenter.....	3
Aeronautics (mechanical).....	2
Store (clerical).....	2
Trucking.....	1
Mining.....	1
Radio.....	1
Barber.....	1
Federal service.....	1
Highway.....	1
CCC.....	<u>2</u>
Total.....	94

ECONOMIC STATUS AND OCCUPATIONS OF FAMILY HEADS

A list of all family heads were compiled from church records with the help of the ward officials. An economic classification was made based largely on the capacity of the family head for work (largely on the basis of age) and on the economic resources at his command. In each community the church bishop and two other leaders were asked to rate each family head. In most cases the three independent ratings were identical. The economic classes used were:

Class I. Family head physically active; but no resources and no regular work.

Group composed largely of those depending on irregular laborer's work. A few owned places to live, and some had enough ground for a garden or a cow pasture. Housing was generally poor; a number lived in crude tent covers. Incomes generally \$300 to \$500 per year.

Class II. Family head physically active and had some resources, but insufficient to adequately support a family.

Group composed largely of farms with 10 to 20 crop acres. Some men had small businesses and part-time jobs. Houses generally owned, but small. Incomes generally in the range of \$500 to \$800, but not regular.

Class III. Family head physically active with resources adequate to support a family. It was assumed that the resources at the command of these family heads would not have to carry an unusual proportion of the support of non-earning families needing work or eligible for relief.

Farm operators were the largest occupational group in this class, followed by "business" and "school". The business group included truckers, contractors, carpenters, and other professional people. The school group contained the salaried family heads. The salary group in this class included the full-time highway maintenance men. Housing is generally satisfactory in size and quality. Incomes generally from \$1,000 to \$2,000.

Class IV. Family head old, but with a little resources.

This group was made up mainly of those too old for continued heavy physical work, but who had pensions, property, small businesses, etc., to give partial support. Some family assistance or other form of support usually was necessary in this group.

Class V. Family heads old, no resources.

This group was made up of those wholly dependent. In most cases the cause was old age or physical infirmity.

Since the ratings were based on family heads only, unmarried adults living at home were not considered as separate family units. Living at home and having no regular jobs were 28 unmarried males from 21 to 34 years of age and averaging 24 years. This group was important, as it represented a large labor supply of the community and was also transitional from the group of school children to the family heads (Class I) with no resources.

Occupational classes were based on the major sources of income. Of the 190 family heads in the three communities, 84 were classed as "farmers", 50 as "wages and salaries", 20 as "business", and 13 as "school" (Table 9).

Table 9.- Number of families by occupational group and economic classification

Occupational group	<u>I.</u>	<u>II.</u>	<u>III.</u>	<u>IV.</u>	<u>V.</u>	<u>Total</u>
School salary	--	1	12	--	--	13
Wages and salaries	38	5	4	3	--	50
Business	--	2	13	5	--	20
Farm	--	48	31	5	--	84
Savings, etc.	--	--	--	15	--	15
Dependent	--	--	--	--	8	8
Total families	38	56	60	23	8	190

It is particularly significant that 48 of the 84 farm operators were in the Class II low income group. These 48 were largely farmers with inadequate units ranging from 5 to 20 crop acres.

Businesses, other than farming fell into two major groups--those that serve the local residents, mainly farmers, and those that supply travel services on U. S. Highway No. 91. These highway travel services ranged from small service stations run by people able to do little more than pump gasoline, to a modern and relatively large lodge and auto court with 63 rooms located near Littlefield, and built by outside capital. Seven places had from 2 to 12 cabins in addition to gasoline, oil, and the usual range of service station products.

Four places, in addition to the lodge, served meals and short orders. With the exception of the lodge at Littlefield, most of the travel service businesses had been developed by local people as travel increased on this highway.

In 1937 the travel services were developed to a capacity beyond even the peak travel load of mid-summer. As a consequence, the all-year earnings of these service businesses was very low. Excessive competition resulted in a very low level of income to the labor used. Under these conditions, the work was done largely by the owners' families or relatives and long working days were necessary. The large lodge development near Littlefield was no exception to this general statement, and the wages offered and the seasonal nature of the employment attracted only the younger group of people of high school age and some young married couples.

About 25 people were employed full time in travel service. In addition, some 12 to 15 were employed part-time in the summer season. The combined amount of employment in the travel service was very important to the community but the average income per person was very low. It did supply transitional support for the younger people seeking permanent occupations.

Bunkerville and Mesquite each had two general stores and one moving-picture theatre which drew patronage mainly from local residents. The labor was largely supplied by owners and their families, and with one or two exceptions, the hired labor used was part-time and seasonal. Part to full-time work was obtained by two or three building contractors, and by about the same number of truckers.

HOUSING CONDITIONS AND DOMESTIC WATER SUPPLY

A brief inspection from the street was made of all of the houses in Mesquite and Bunkerville, to check the number, size and condition. All places where families lived, including tent houses were counted. The size was tabulated according to the approximate number of rooms, as judged from the exterior. The condition was tabulated as "good," "fair," and "poor," as judged by the exterior appearance and maintenance. Each of these three conditions were separated in "finished" and "unfinished" exterior. Painted, stucco, brick, or concrete block surfaces were classed as "finished."

The check showed 154 houses for the 170 family units. Sixty of the 154 houses were "finished" and 94 "unfinished." Forty-four were classed as in "good" condition, 42 in "fair" condition, and 68 in "poor" condition. Sixty-three, or 41 percent, were estimated to have three rooms or less. This fact, considering also that some houses sheltered two families and that the families averaged about five persons, indicated that over-crowding was common among the low income group.

The domestic water supply in the past was secured largely by carrying spring flood waters through the irrigation canals into concrete cisterns. With the advent of good roads, some people began to haul culinary water from the Beaver Dam Wash, about 12 miles from Mesquite and 17 miles from Bunkerville. Since 1936, through cooperation of the Soil Conservation Service, the Works Progress Administration and the Latter Day Saints Church, a ten-mile pipe line and a series of concrete storage tanks have been constructed to bring mountain spring water into the Mesquite and Bunkerville Communities.

ECONOMIC RELATIONSHIPS OF SCHOOLS

Particular attention was given to an analysis of economic aspects of the school system. It was discovered early in the study that the school system was the largest single business in the Virgin Valley. It was also very significant that in 1936 the school district of which Virgin Valley

was a part, had the highest special district tax rate in the state. Purely educational matters were not considered, as they were not within the province of the study.

The Virgin Valley (Nevada side) is in Educational District No. 1, Clark County. This district includes schools at Moapa, Logandale, and Overton, in the Moapa Valley; and schools at Bunkerville and Mesquite in the Virgin Valley. Beginning grades and high school grades were taught at the Bunkerville school; intermediate grades, at Mesquite.

School Costs and Community Income

For several years the annual total operating costs of Educational District No. 1 have been between \$80,000 and \$85,000. Segregations from the budget for the fiscal year 1936-37 showed that approximately \$34,083, or 40 percent, of this total expense applied to the operation of the Virgin Valley schools.

Of the \$34,083, an estimated \$26,000 was directly and indirectly a payment for services supplied by the community. In 1936-37, the schools in Educational District No. 1 were giving full-time employment to 14 teachers and two janitors. In addition, part-time employment was given to four bus drivers and an estimated \$4,000 was spent for labor payments in items of lights, water, fuel, substitute teachers, and general maintenance. This was equivalent to full-time employment for about 20 persons. The Littlefield and Lone Star schools in Arizona employed three teachers.

Assessed Valuation and Tax Rates

In 1934 Education District No. 1 had a total assessed valuation of \$4,304 per student in average daily attendance. The assessed value of the locally owned property was about \$700 per student in average daily attendance. The total assessed valuation of \$4,304 is made possible largely by extending the boundaries of the district to include about one-third of the main line railroad property in Clark County.

In Figure 2, the assessed valuation of property per average daily attendance in Educational District No. 1 is compared to the similar figure for the same year in a number of Nevada counties and to the average for the state as a whole. Clark County, of which Educational District No. 1 is a part, had a total assessed valuation of \$5,093 per student in average daily attendance. The general farm county of Churchill had an average of \$8,523. The state average was \$11,574, and Pershing County, the highest, had an average of \$33,640. 5/

5/ It should also be noted that the location of a mainline railroad through this county of relatively low population density, accounts for its top position in assessed valuation per average daily attendance.

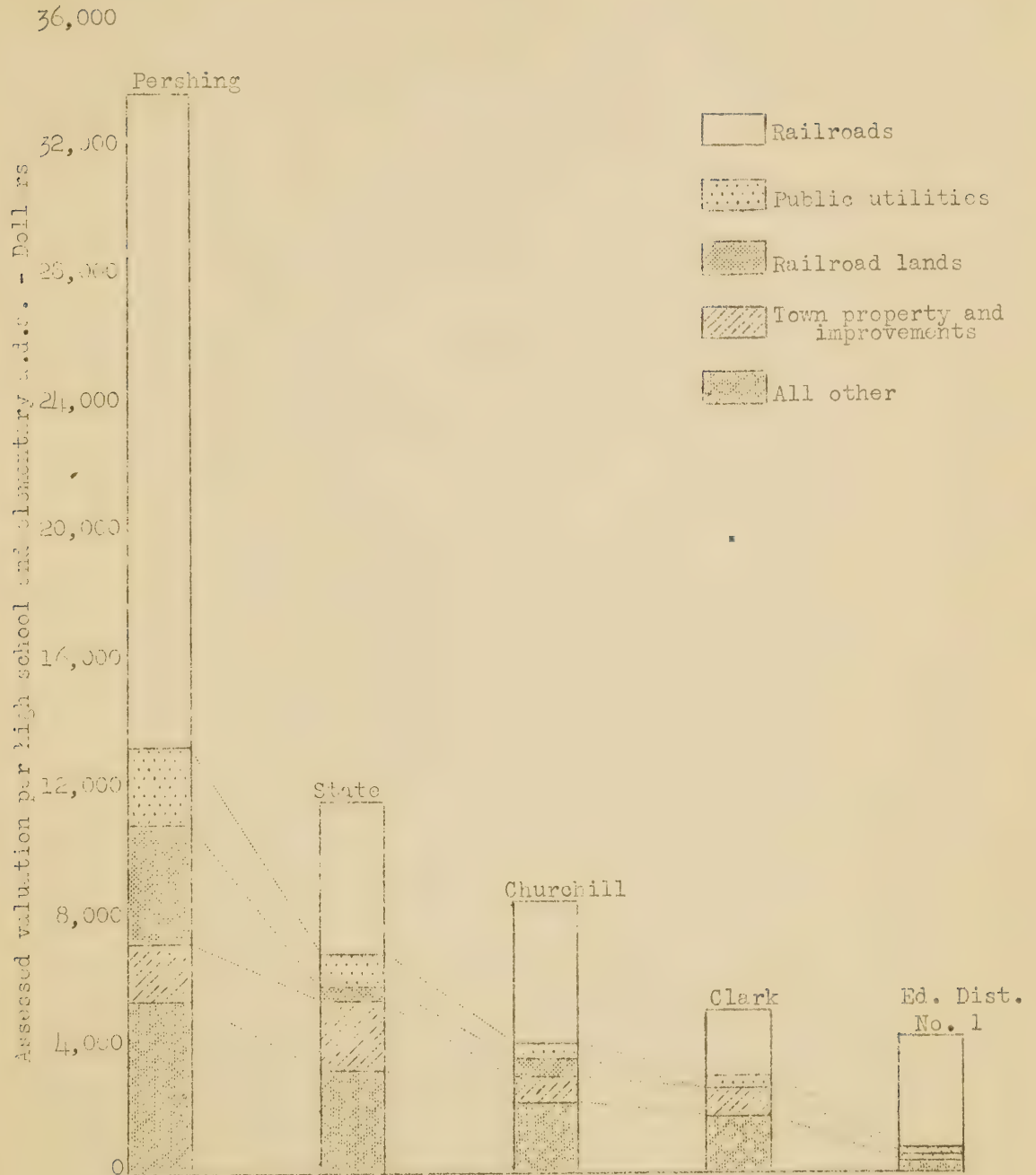


Figure 2.--Comparison of the assessed valuation of the several classes of property per "average daily attendance" of total high school and elementary schools in Educational District No. 1, Clark County, with similar data from Clark, Churchill, and Pershing Counties and with the State of Nevada, 1934

Source of data: Reports of the State Tax Commission and the State Superintendent of Schools

Figure 2 also shows the amount of assessed valuation by classes of property for average daily attendance in Educational District No. 1 in 1934 as compared with similar property classifications in these same counties. Of the total assessed valuation of the district only about 17 percent is property connected primarily with the activities of the residents. The remainder, 83 percent, consists of interstate utilities which cross the district, but derive only a small amount of their total business from it.

Analysis of the receipts of Clark County (Nevada) Educational District No. 1 from 1933 to 1936 shows that 51.9 percent came from the special district levy, 20.5 percent from the regular county levy for elementary schools, 13.8 percent from the regular state apportionment, 3.6 percent from the state relief funds, and 5.2 percent from minor sources, (Table 10). Of course, a small part of the state apportionment was originally collected from property within the district. It is estimated that about 72 percent of the total school costs were paid by the local district, county and state levies. Multiplying this by the 17 percent of the local tax base that was property connected primarily with activities of the residents gives 12 percent as the approximate proportion of total school costs that was borne by the local community.

Table 10.- Average yearly receipts of Educational District No. 1, Clark County, by sources, 1933-36
Source: District Records

Source	Average yearly receipts	Percent
Special district levy	\$40,097	51.9
County levy for elementary schools	15,322	20.5
Regular state apportionment	10,666	13.8
State relief	6,641	3.6
Vocational agriculture	2,794	3.6
Tuition and miscellaneous	1,257	1.6
Total	\$77,277	100.0

The very low ratio of property to people has necessitated a level or property taxes in Clark County Educational District No. 1 near the limit of \$5.00 per \$100 assessed valuation, as allowed by the Nevada Constitution. The special school district levy of \$1.80 per \$100 assessed valuation in 1935-36 was the highest special levy in the state. The apportionment of state school monies to the district from the relief and emergency fund averaged \$12.00 annually per "average daily attendance" in the period from 1933-36, compared to \$9.85 for Clark County and \$4.16 for the state.

The changes in the assessed valuation per pupil in average daily attendance in Educational District No. 1, and in selected areas for the period from 1920 to 1935, are shown in Figure 3. The low assessed

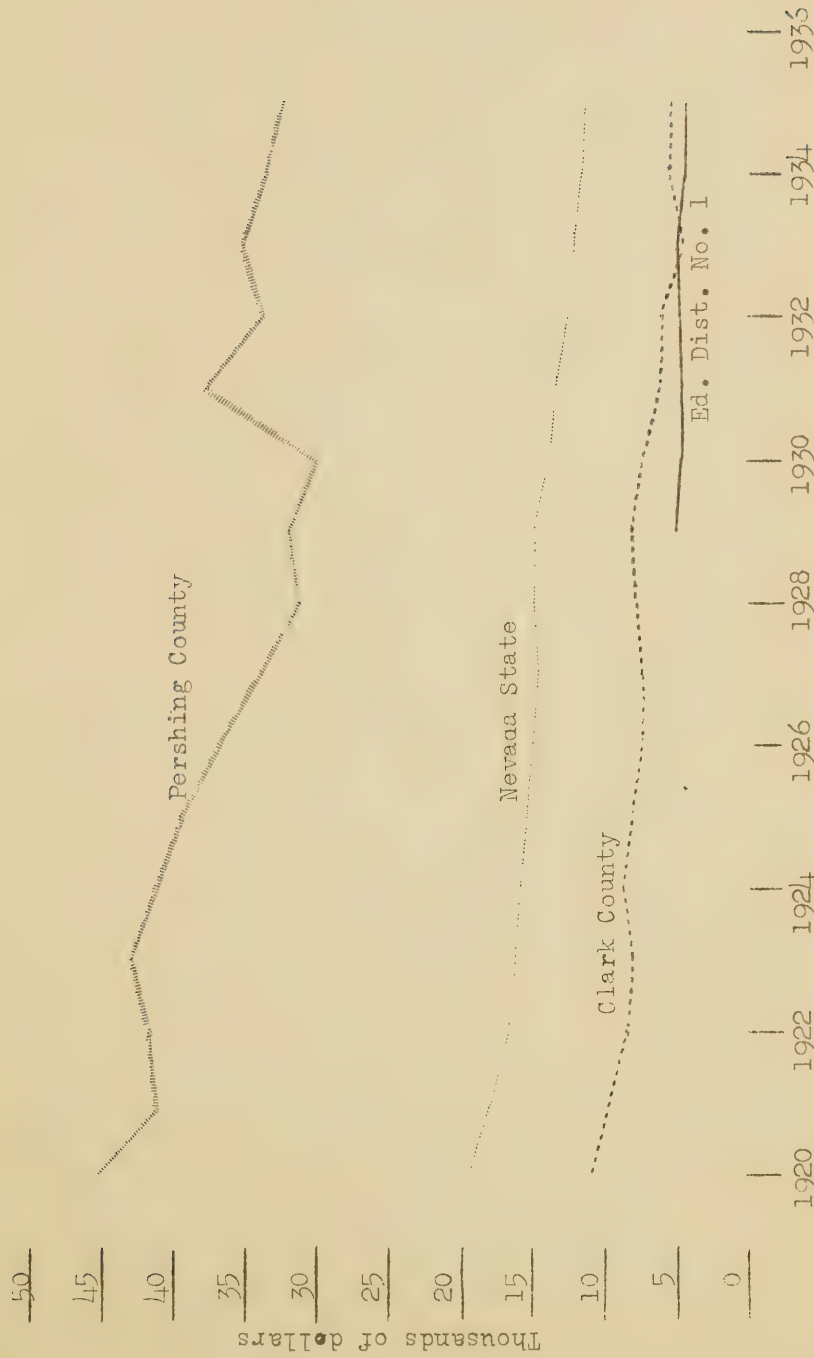


Figure 3.--Assessed valuation per "average daily attendance" in elementary and high schools in Educational District No. 1, Clark County, compared with selected areas

valuation per "average daily attendance" in Clark County was a condition of several years' standing for the entire county, and had always existed in Educational District No. 1. Even with the added revenues from the addition of about \$2,000,000 of assessed value of interstate utility property to the assessed value of the property owned and used locally, the legal taxation limits of Educational District No. 1 were strained to maintain the schools. The average daily attendance of the elementary grades for the 1936-37 year was 139 students, and for the high school, 73 students. Neither of these figures has changed much since 1925. However, the analysis of the age groups of the population gave evidence that since 1929 many of the younger married group, who ordinarily would have found employment elsewhere, have remained in the community. The children of this group probably will make a decided upward trend in the elementary enrollment in the next few years, unless some change occurs in the present trend of migration.

PUBLIC RELIEF COSTS

Heavy federal relief in the Virgin Valley began with the Civil Works Administration, in the winter of 1933-34 when approximately \$13,000 in payrolls in Mesquite and Bunkerville were spent on canal head-works, river bank protection, flood-wash protection and street improvements. Work relief in small amounts was granted very liberally to farmers, regardless of their relative economic standing in the community. This liberal policy was generally true in other areas and was due to the widespread draught conditions and low farm prices in the United States that year.

Case records in the Las Vegas office of the Works Progress Administration showed that 83 families residing in the Virgin Valley (Nevada only) in 1937 received from National Emergency Relief Administration and Works Progress Administration projects in the period from the spring of 1934 to December 31, 1936, a total of \$13,146. The distribution of payments by the family head economic groups is shown in Table 11.

Thirty-six of the Group II families received an average of \$131 per case, the highest average for any group, probably due to the fact that this group had some resources, generally a very small farm and could not take work too far from home.

The classification of the family heads into economic groups was based on all income going to the immediate family. Under the condition existing at the time, the families in the highest earning group (Group III) were carrying much of the support of the lowest earning groups (Groups I, II, IV and V). It is quite normal for people in the higher income group to assist people in Groups IV and V, but not the younger able-bodied families in Groups I and II. Because of the extra people, largely relatives, that the Group III were partially supporting, the relief was frequently as much needed as in the other groups. Relief to this group would not be necessary if the Valley population was in good relation to the economic resources.

Table 11.- Total NERA and WPA Payments to Cases Originating in the Virgin Valley, by Economic Groups, Nevada Only, from the Beginning of NERA in 1934 to December 31, 1936
Source: WPA Records

Economic Group	Total number of families	Families receiving assistance	Percent	Total payments	Average payment per case
Group I	35	22	63	\$3542	\$161
Group II	48	36	75	6505	131
Group III	55	17	31	1406	33
Group IV	24	11	46	1569	143
Group V	<u>8</u> <u>2/</u>	<u>2</u>	<u>25</u>	<u>124</u>	<u>62</u>
Total	170	38	52	\$13146	\$149

1/ Does not include about \$2500 paid to 27 cases listed as originating in Virgin Valley but not resident there on January 1, 1937.

2/ Excluding the 20 families resident in Arizona for which comparable information was not obtained.

The relatively small amounts of county relief are not included in the above totals. The county relief was usually direct in cash or commodities and went largely to families and persons not able to perform much labor. The Farm Security Administration has had in the Virgin Valley 32 grant cases which did not have sufficient resources to justify a standard rehabilitation loan. These grants largely went to operators in Groups II and IV. A small amount of relief income was received directly from CCC enrollees.

Some opportunities for work and incidental horse hire came to the community from the CCC camp located at Bunkerville. Some relief cases were certified for employment in the Forest Service, Public Works Administration and on highway construction projects.

Inadequate data were obtained on the relief payments to the 25 families residing in Arizona. Conditions were generally similar, however, on the Arizona side.

Work relief and direct relief amounting to an average of \$80 per farm was received in 1936 by families on 22 of the 39 farms on which the farm survey records were obtained.

POPULATION IN RELATION TO RESOURCES

Preceding discussion has indicated that the population of the Virgin Valley greatly exceeded the opportunities for economic support and that there appeared to be little immediate possibility of increasing such opportunities. The few hundred acres of undeveloped land irrigable by gravity are not high quality and would require excessive costs for leveling and development. Highway travel services, the principal income producing source other than farming, was already over-expanded.

It appeared, therefore, that the 38 families in Group I, with no regular source of income, and 25 to 30 single men over 21 years of age were surplus population for the resources of the Valley. It might also be considered that about a third of the families in Group II were in the surplus group, since the land used and outside work obtained by them are both needed to increase incomes of the remaining portions of the group to a size that would provide an adequate standard of living.

Measures to keep the community population balanced with the resources should be directed toward relocation of the younger married couples, and also directed toward "vocational guidance" of the younger men in and just out of high school, to the end that the excess population in both these groups will be better prepared for the migration to, and social adjustment in a more favorable economic environment.

The middle-aged family heads in the excess groups have little resources, know few trades, and probably would need considerable assistance both of financial nature and in definite direction into opportunities elsewhere. The younger married groups and the single men just above high-school age would be more amenable to the changes in occupation and location as a result of vocational guidance.

A check of the population lists showed very few single women over 21 years of age. This led to the conclusion that, from an excess population point of view, the existing vocational guidance for the girls was satisfactory. Of course, additional vocational guidance for the young women who marry valley men might result in more migration of these couples.

The population reduction discussed above would increase the resources per capita and thereby permit an increase in the average income of the families in the Valley.

Appendix Table 1.- Monthly and Seasonal Discharge of the Virgin River and Maximum and Minimum Flow by Seasons, at Littlefield, Arizona
Source: U.S.G.S.

Water Year	Acre Feet												Totals 1/
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1929-30	5,310	7,560	9,040	13,300	14,600	9,900	3,510	28,000	6,370	5,730	52,200	29,000	190,000
1930-31	16,000	13,400	13,100	14,400	17,200	7,310	5,590	14,280	3,700	3,620	8,980	6,310	119,000
1931-32	5,390	17,000	11,300	9,530	26,300	11,600	15,500	63,300	20,500	23,100	68,900	7,200	401,000
1932-33	10,600	10,000	16,000	14,100	13,300	12,400	9,220	17,700	6,840	6,390	5,740	3,390	131,000
1933-34	7,090	11,260	16,050	13,120	10,010	7,600	3,790	2,990	3,190	4,010	3,310	3,250	86,000
1934-35	5,040	6,310	12,960	14,270	13,580	15,120	34,300	31,700	3,170	4,660	11,960	5,170	164,000
1935-36	3,930	7,330	11,030	8,670	17,580	12,600	17,670	9,010	3,970	13,710	11,380	3,520	131,000
1936-37	11,700	12,250	11,330	9,410	29,110	41,630	47,010	45,770	14,950	12,580	5,330	10,190	252,000
1937-38	5,800	3,590	15,520	17,190	17,920	34,350	56,330	44,210	6,530	4,640	11,220	5,450	279,000

Maximum Flow		Minimum Flow	
cfs.	date	cfs.	date
6,000	Aug.	27	July
1,860	Nov.	35	July
20,000	Aug.	No record	
1,200	May	26	June & July
954	Dec.	32	Aug. & Sept.
1,300	Aug.	23	Aug.
2,710	July	47	Oct.
1,440	Feb.	39	Sept.
17,000	Mar.	55	June

1/ Rounded to nearest thousand.

Appendix Table 2.- Productive Work Units (P.W.U.) Required Per Year
for Specified Farm Enterprises

Source: Farm Management Studies by the Nevada Agricultural Experiment Station and the Nevada Agricultural Extension Service. A productive work unit is the accomplishment of an averager farmer in an average (9 hour) day. It includes both the direct labor on the enterprise and a portion of the indirect labor on care of machinery, buildings, fences, and other overhead labor.

Note: Multiply the number of work units by nine to get the average number of hours required yearly for each unit of stock or crops.

	P.W.U.:		P.W.U.
Dairy-per cow		: Alfalfa-per acre:	
Hand milking, in herds of		: 2.0 to 3.0 ton yield	3.0
Less than 10.0 cows	17.70	: 3.1 to 4.0 " "	3.4
10.1 to 20.0 "	16.00	: 4.1 to 5.0 " "	3.6
20.1 to 30.0 "	14.00		
30.1 to 40.0 "	12.50	: Grass hay-per acre	1.1
Over 40 "	11.10		
		: Grain-per acre	3.3
Machine milking in herds of			
15 cows and over	11.10	: Nurse crop or grain	
		: hay-per acre	1.8
Other cattle-per animal unit <u>1/</u>			
In farm herds of		: Corn, ensilage-per acre	
Less than 5.0 a.u.	4.60	: 10-ton yield	12.0
5.0 to 14.9 a.u.	3.20		
15.0 to 24.9 a.u.	1.90	: Potatoes-per acre	
25.0 a.u. and over	1.20	: 7-ton yield	14.3
In range herds	.90		
		: Cantaloupes-per acre	
Sheep-farm flock		: 114-crate yield	10.2
per ewe	.56		
		: Pasture-per acre	
Swine-per cwt.		: Good	.5
Less than 20.0 produced	1.31	: Poor	.5
20.1 to 50.0 "	.70		
50.1 to 200.0 "	.45	: Asparagus <u>2/</u>	22.0
200.1 and over "	.35	: Radishes <u>2/</u>	35.0
		: Tomato plants <u>2/</u>	35.0
Turkeys-per bird		: Beet seed <u>2/</u>	12.0
Natural method	.35	: Garden	15.0
Brooder method	.26	: Orchard-Commercial <u>2/</u>	8.0
		: Orchard-Home use <u>2/</u>	4.0
Chickens-per hen	.30	: Grain pasture	1.8

1/ One head mature stock, or two head immature stock.

2/ Data from sources outside Nevada.

Appendix Table 3.- Source and Average Amount of Receipts per Farm,
1936, by Size Groups

		Productive work units			Percent	
		100 to	150 to	250 &	All	All
	Unit	149	249	over	Groups	Groups
Records	No.	12	19	8	39	
Farm Produce Sales	Dol.					
Cattle	"	17	52	369	106	9.5
Eggs	"	85	145	221	142	12.8
Grain	"	31	77	201	88	7.9
Misc.	"	26	75	197	85	7.7
Hay	"	56	139	144	114	10.3
Hogs	"	42	61	141	72	6.4
Butterfat	"	27	40	100	48	4.3
Poultry	"	16	101	42	63	5.7
Misc. Livestock	"	2	14	34	15	1.4
Total produce sales	"	302	704	1449	733	66.0
Labor off farm and custom work	"	417	372	331	377	34.0
Total farm receipts	"	719	1076	1780	1110	100.0
Non-farm income <u>1/</u>	"	127	22	--	50	
Total receipts	"	846	1098	1780	1160	

1/ Income unrelated to labor of current year or to inventoried assets.

Appendix Table 4.- Average Operating Expenses per Farm, 1936, by Size Groups

		Productive work units			
		100 to	150 to	250 &	All
	Unit	149	249	over	Groups
Records	No.	12	19	8	39
Cash operating costs	Dol.				
Feed purchased	"	82	114	160	113
Crop expense <u>1/</u>	"	57	86	121	84
Water assessments <u>2/</u>	"	73	92	120	92
Hired labor	"	28	18	30	34
Property taxes	"	38	45	54	45
Livestock expense <u>3/</u>	"	18	33	43	30
Car operation, personal share	"	52	40	31	42
Land rent	"	--	2	28	7
Mach. repairs and oper.	"	13	25	20	21
Seed	"	1	9	12	7
Improvement expense	"	2	9	13	8
Miscellaneous	"	7	7	4	6
Total cash operating costs	"	371	480	686	489
Depreciations <u>4/</u>	"	41	72	39	66
Total expenses	"	412	552	775	555
Expense per crop acre	"	24	20	20	21
Percent water assessments of total	Per-cent	18	17	15	17

1/ Fertilizers, hay baling, bags, crates, etc.

2/ Largely a non-cash item as most farmers work out their ditch assessments.

3/ Chix, poults, breeding, veterinary, etc., and livestock purchases.

4/ Dwelling was handled as "personal" rather than a "farm" item.

Appendix Table 5.- Average Family Living Costs per Farm, 1936, by Size Groups

		Productive work units			All Groups
		100 to 149	150 to 249	250 & over	
	Unit				
Records	No.	12	19	8	39
Cash expenses	Dol.				
Food	"	202	207	197	205
Clothing	"	81	137	96	103
Entertainment	"	10	31	21	23
Medical expense	"	73	89	23	71
Car operation, pers.share	"	20	10	41	20
Dwelling and equipment repair	"	16	19	36	21
Education	"	4	35	27	24
Church contributions	"	22	41	53	38
Personal insurance	"	14	27	33	24
Fuel, lights and water	"	13	15	19	15
Other	"	4	21	21	16
Total cash expenses	"	459	632	567	565
Farm produce	"				
Dairy products	"	101	110	125	110
Eggs	"	28	30	35	30
Poultry	"	18	17	11	16
Pork	"	17	21	14	19
Beef	"	3	5	11	6
Mutton	"	--	1	19	4
Wood	"	61	65	61	63
Total farm produce	"	223	249	276	243
Depreciations	"				
Dwelling	"	42	32	38	37
Car, personal share	"	15	9	36	16
Total depreciations	"	57	41	74	53
Total family living costs	"	744	922	917	866

